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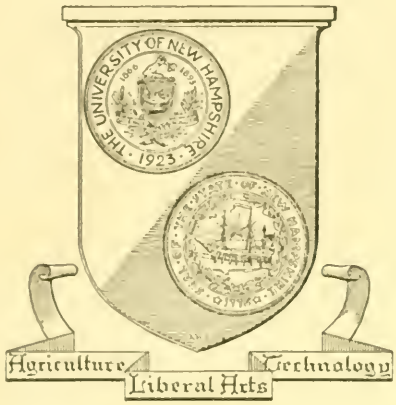

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AGRICULTURAL EXPERIMENT STATION
Department of Agricultural Chemistry

Inspection of Commercial Fertilizers for 1938

MADE FOR THE
STATE DEPARTMENT OF AGRICULTURE

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THE UNIVERSITY OF NEW HAMPSHIRE
DURHAM, N. H.

University of New Hampshire
Agricultural Experiment Station

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

STATE DEPARTMENT OF AGRICULTURE

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Andrew L. Felker, Commissioner of Agriculture. The state inspector, Mr. Eugene D. Sanborn, collected samples of 106 brands of fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1938. The general character of the fertilizer materials collected is shown by the following classification:

Complete fertilizers	76
Phosphoric acid and potash	1
Superphosphate (acid phosphate)	13
Nitrate of soda	2
Sulphate of ammonia	1
Muriate of potash	2
Ground bone	4
Natural manures	7
	106

THE FERTILIZER LAW

The state official charged with the enforcement of the fertilizer law is the Commissioner of Agriculture. Copies of the law may be obtained from his office in Concord. All inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The purchaser's refusal to buy a fertilizer which does not conform to the law in every respect, will not only assist in the enforcement of the law but will at the same time insure himself the protection of the law. If the buyer fails to assure himself that the legal requirements have been met, he accepts the fertilizer at his own risk. Whether or not the purchaser familiarizes himself with the complete text of the fertilizer law, he should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in

compliance with the law. The law governing these matters follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package, the name, brand or trademark under which the fertilizer is sold, the name and address of the manufacturer or importer, the location of the factory, and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which would doubtless soon appear upon the market if the sale of fertilizer was not under state regulation. The value of a fertilizer depends mainly upon its content of available plant food, particularly nitrogen, phosphoric acid and potash. The presence of these constituents can only be determined by a chemical analysis. To insure that they are being furnished by the manufacturer in the guaranteed amounts, it is necessary that each brand of fertilizer offered for sale be officially inspected and analyzed one or more times each year. When failure to meet the guarantee is proven by chemical analysis, the prosecution or seizure provisions of the law may be invoked. All of the samples reported in this bulletin were officially taken by an inspector appointed by the Commissioner of Agriculture. The chemical analyses were made by the official methods of the Association of Official Agricultural Chemists.

In Table I are tabulated the grades of complete fertilizers analyzed in this year's inspection, the number of brands sampled by the inspector in each grade, the average per cent of nitrogen, of available phosphoric acid, of water soluble potash and the average retail price per ton.

TABLE I

Formula	Number of brands	Average per cent nitrogen	Average per cent available phosphoric acid	Average per cent water soluble potash	Average retail price per ton
2–8–10	1	2.37	8.20	9.05	30.69
2–12–4	1	2.47	12.34	4.68	32.00
3–10–4	5	3.09	10.02	4.39	32.23
3–10–6	1	3.07	10.02	6.03	36.00
4–8–4	10	4.02	8.04	4.10	34.18
4–8–7	3	4.18	7.94	7.43	37.33
4–8–8	2	4.01	8.37	7.86	30.60
4–8–10	9	4.03	8.12	9.92	38.39
4–12–4	3	4.01	11.97	4.42	30.60
4–12–6	1	3.77	12.02	5.81	36.14
4–16–4	1	4.17	15.27	4.04	35.28
5–8–7	11	5.01	8.11	7.12	38.67
5–8–10	3	5.20	7.87	9.16	39.67
5–10–4	1	5.08	10.45	4.32	88.00
5–10–10	1	5.25	10.03	10.48	60.00
6–8–6	1	6.18	8.49	6.74	32.00
7–5–3	1	6.91	5.13	3.48	65.00
7–6–6	5	6.93	6.36	6.06	41.00
7–8–6	1	7.06	8.74	6.32	39.00
7–14–19	1	7.15	14.47	19.51	46.40
8–5–8	1	8.05	6.43	8.59	58.00
8–6–2	2	8.05	6.85	2.24	55.00
8–8–8	1	8.46	7.29	9.43	42.00
8–16–14	4	8.10	16.06	13.52	55.02
8–16–16	2	7.94	16.48	16.23	48.10
8–16–20	2	7.51	14.71	18.37	57.15
8–20–12	1	8.02	20.66	12.27	46.20
8–24–8	1	8.02	24.61	8.16	46.20

CONFORMITY TO GUARANTEE

Three of the brands were deficient in all of the three guaranteed constituents, nitrogen, available phosphoric acid, and water soluble potash. Nine brands were deficient in two of the three constituents, three in nitrogen and available phosphoric acid, four in nitrogen and potash, and two in available phosphoric acid and potash.

Twenty-two brands were found to contain less than the guaranteed amount of nitrogen. The greatest deficiency was 0.70 per cent. The average of the other 21 nitrogen deficiencies was 0.17 per cent.

Eighteen brands failed to meet the guarantee in available phosphoric acid. One brand was deficient 2.68 per cent. The average of the other 17 deficiencies was 0.39 per cent.

Fifteen brands contained less potash than the guarantee. The greatest deficiency was 3.17 per cent. The average of the other 14 deficiencies was 1.00 per cent.

In the tabulation of the analyses in the following pages deficiencies of one-fourth of one per cent or more are shown in bold-faced type. The manufacturers are arranged alphabetically. The brand name is listed alphabetically or numerically by formula under the manufacturer.

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Agricultural Chemical Co. North Weymouth, Mass.								
AA Complete Manure with 10% Potash 4–8–10	4.00	4.03	....	8.72	8.00	8.01	10.00	9.90
AA Corn Favorite 3–10–4	3.00	3.09	....	10.36	10.00	**9.40**	4.00	4.08
AA Double Strength Fertilizer 8–16–14	8.00	7.87	....	16.27	16.00	**15.67**	14.00	**13.29**
AA Monarch Fertilizer 4–8–4	4.00	3.86	....	8.49	8.00	8.01	4.00	4.00
AA Potato and Vegetable Fertilizer 5–8–7	5.00	4.94	....	8.78	8.00	8.03	7.00	7.00
AA Prolific 10% Potash Fertilizer 2–8–10	2.00	2.37	....	8.78	8.00	8.20	10.00	**9.05**
AA Superphosphate 16%	....	....	....	17.17	16.00	16.21	....	....
AA Superphosphate 20%	....	....	....	21.20	20.00	21.08	....	....
AA Top Dresser 7–6–6	7.00	6.97	....	6.54	6.00	6.14	6.00	6.09
Agrico Country Club Fertilizer 8–6–2	8.00	8.06	....	7.34	6.00	6.84	2.00	2.13
Agrico for Aroostook with 10% Potash 5–8–10	5.00	5.04	....	8.25	8.00	7.78	10.00	10.26
Agrico for Corn 3–10–6	3.00	3.07	....	10.70	10.00	10.02	6.00	6.03
Agrico for Corn 4–12–6	4.00	3.77	....	12.52	12.00	12.02	6.00	5.81
Agrico for New England 4–8–10	4.00	4.03	....	8.53	8.00	8.11	10.00	9.78
Agrico for Potatoes 8–16–20	8.00	**7.65**	....	16.30	16.00	16.10	20.00	**19.37**
Agrico for Potatoes and Vegetables 5–8–7	5.00	5.04	....	8.61	8.00	**7.75**	7.00	7.16
Bowker's Market Garden Fertilizer 4–8–4	4.00	4.03	....	8.68	8.00	7.77	4.00	4.00
Fine Ground Bone	2.47	2.48	23.00	24.97	....	15.67	....	....
Muriate of Potash	....	....	....	....	....	....	50.00	**47.76**
Sulphate of Ammonia	20.50	20.64	....	....	....	....	....	....

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Apothecaries Hall Co. Waterbury, Conn.								
Liberty High Grade Corn 2–12–4	2.00	2.47	....	13.46	12.00	12.34	4.00	4.68
Liberty High Grade Market Garden 5–8–7	5.00	5.16	....	9.16	8.00	8.68	7.00	7.25
Liberty Market Garden Special 4–8–4	4.00	4.07	....	9.14	8.00	8.66	4.00	4.16
Liberty Potato and General Crops 4–8–10	4.00	4.05	....	9.03	8.00	8.44	10.00	9.81
Liberty Special Fertilizer for Fruit 7–8–6	7.00	7.06	....	9.36	8.00	8.74	6.00	6.32
Liberty Top Dresser 8–8–8 for Grass and Grain	8.00	8.46	....	7.36	8.00	**7.29**	8.00	9.43
Superphosphate (Acid Phosphate)	....	....	....	17.07	16.00	16.77	....	....
Armour Fertilizer Works Carteret, N. J.								
Armour's Big Crop Fertilizer 3–10–4	3.00	2.92	....	10.55	10.00	10.03	4.00	4.31
Armour's Big Crop Fertilizer 4–8–4	4.00	3.91	....	8.38	8.00	8.04	4.00	4.00
Armour's Big Crop Fertilizer 4–8–10	4.00	4.03	....	8.53	8.00	8.04	10.00	10.00
Armour's Big Crop Fertilizer 4–12–4	4.00	**3.73**	....	12.53	12.00	11.83	4.00	4.11
Armour's Big Crop Fertilizer 4–16–4	4.00	4.17	....	16.28	**16.00**	**15.27**	4.00	4.04
Armour's Big Crop Fertilizer 5–8–7	5.00	**4.75**	....	8.89	8.00	8.33	7.00	7.02
Armour's Big Crop Superphosphate 20%	....	....	....	21.35	20.00	20.19	....	....
Armour's Bone Meal Fertilizer	2.47	**2.74**	23.00	23.45	....	13.30	....	....
Armour's Fertilizer 4–8–8	4.00	3.83	....	8.62	8.00	8.07	8.00	**7.54**
Armour's Fertilizer 8–16–16	8.00	7.88	....	16.72	16.00	16.28	16.00	16.09

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
The Barrett Company Hopewell, Va.								
Arcadian, The American Nitrate of Soda	16.00	16.07	....	....	....	....	....	....
Joseph Breck & Sons Boston, Mass.								
Brexone: for Lawns and Flower Gardens	5.00	5.08	...	10.63	10.00	10.45	4.00	4.32
Buell Fertilizer Co. Exeter, N. H.								
Buell Peat—Poultry Manure	3.00	3.04	3.00	2.15	....	1.96	1.50	1.52
Chilean Nitrate Sales Corp. New York, N. Y.								
Chilean Nitrate of Soda, Champion Brand	16.00	16.09	....	....	....	....	....	....

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Consolidated Rendering Co Boston, Mass.								
Corenco 4–8–4 Corn and Vegetab'e	4.00	4.06	....	8.70	8.00	8.37	4.00	4.07
Corenco 4–8–7 Market Garden	4.00	4.04	....	8.31	8.00	8.00	7.00	7.09
Corenco 4–8–10 Potato Grower	4.00	4.03	....	8.35	8.00	8.03	10.00	10.11
Corenco 5–8–7 General Crop Manure	5.00	5.08	....	8.37	8.00	8.13	7.00	7.05
Corenco 7–6–6 Complete Fruit and Top Dressing	7.00	7.04	....	6.70	6.00	6.58	6.00	6.00
Corenco 8–16–20	8.00	**7.37**	....	13.83	16.00	**13.32**	20.00	**17.36**
Corenco Ground Bone	2.47	2.58	23.00	24.87	....	15.42	....	....
Corenco Sheep Manure	1.25	1.59	1.00	1.02	....	0.95	2.00	3.00
Muriate of Potash	....	....	....	....	....	....	60.00	61.10
New England 8–6–2 Putting Green Special	8.00	8.04	....	7.20	6.00	6.86	2.00	2.34
Superphosphate 16%	....	....	....	16.62	16.00	16.52	....	....
Superphosphate 20%	....	....	....	20.85	20.00	20.60	....	....
Eastern States Farmers' Exchange Springfield, Mass.								
Eastern States 0–20–20 Open Formula Fertilizer	....	....	....	20.32	20.00	20.12	20.00	20.83
Eastern States 4–8–8 Open Formula Fertilizer	4.00	4.18	....	9.33	8.00	8.66	8.00	8.18
Eastern States 4–12–4 Open Formula Fertilizer	4.00	4.31	....	13.39	12.00	12.03	4.00	4.65
Eastern States 6–8–6 Open Formula Fertilizer	6.00	6.18	....	9.12	8.00	8.49	6.00	6.74

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Eastern States Farmers Exchange—Continued								
Eastern States 7–14–19 Open Formula Fertilizer	7.00	7.15	....	14.76	14.00	14.47	19.00	19.51
Eastern States 8–16–16 Open Formula Fertilizer	8.00	8.00	....	17.11	16.00	16.68	16.00	16.37
Eastern States 8–20–12 Open Formula Fertilizer	8.00	8.02	....	20.97	20.00	20.66	12.00	12.27
Eastern States 8–24–8 Open Formula Fertilizer	8.00	8.02	....	25.25	24.00	24.61	8.00	8.16
20% Superphosphate Granular	....	....	20.50	21.60	20.00	20.91	....	....
International Agricultural Corp. Woburn, Mass.								
Caribee Green and Fairway Fertilizer 7–5–3	7.00	6.91	....	5.67	5.00	5.13	3.00	3.48
Caribee Market Garden Fertilizer 5–10–10	5.00	5.25	....	10.69	10.00	10.03	10.00	10.48
International 3–10–4 Fertilizer	3.00	3.17	....	10.47	10.00	10.27	4.00	4.62
International 4–8–4 Fertilizer	4.00	4.02	....	8.13	8.00	8.00	4.00	4.02
International 4–8–7 Fertilizer	4.00	4.26	....	8.05	8.00	7.81	7.00	7.78
International 4–8–10 Fertilizer	4.00	4.00	....	8.61	8.00	8.43	10.00	**9.46**
International 5–8–7 Fertilizer	5.00	5.25	....	8.47	8.00	8.31	7.00	7.09
International 5–8–10 Fertilizer	5.00	5.12	....	8.53	8.00	8.33	10.00	10.28
International 7–6–6 Fertilizer	7.00	6.86	....	6.58	6.00	6.27	6.00	6.00
International 8–16–14 Fertilizer	8.00	8.20	....	15.66	16.00	**15.44**	14.00	**12.12**
International 16% Superphosphate	....	....	....	16.78	16.00	16.16	....	....
International Granular 20% Superphosphate	....	....	....	20.75	20.00	20.55	....	....

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Merrimack Farmers' Exchange, Concord, N. H.								
Merrimack Brand 3–10–4	3.00	3.16	....	10.65	10.00	10.09	4.00	4.21
Merrimack Brand 4–8–4	4.00	4.00	....	8.46	8.00	8.00	4.00	4.00
Merrimack Brand 4–8–10	4.00	3.93	....	8.31	8.00	8.01	10.00	10.08
Merrimack Brand 5–8–7	5.00	5.02	....	8.45	8.00	8.07	7.00	7.14
Merrimack Brand 7–6–6 Top Dressing	7.00	6.94	....	6.56	6.00	6.32	6.00	6.07
Merrimack Brand 8–16–14	8.00	8.05	....	17.82	16.00	17.10	14.00	14.02
Alfred Ledoux, Manchester, N. H.								
Sheep Fertilizer	1.92	1.22	8.10	0.37	....	0.34	6.32	3.15
Miller Chemical & Fertilizer Corp., Baltimore, Md.								
Rich Yield Fertilizer 4–8–4	4.00	3.86	....	8.31	8.00	7.51	4.00	4.05
Rich Yield Fertilizer 5–8–7	5.00	1.66	....	8.64	8.00	8.00	7.00	6.80
Rich Yield Fertilizer 5–8–10	5.00	5.44	....	8.09	8.00	7.49	10.00	6.93

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
National Guano Co. Aurora, Ill.								
Cattle Manure	1.65	1.74	....	0.91	0.85	0.73	1.80	2.30
Pulverized Sheep Manure	2.00	1.89	....	1.09	1.00	0.94	2.00	2.52
Norwood Fertilizer Co. Lynn, Mass.								
Norwood Regular Brand Sheep Manure	1.83	1.93	0.89	**0.44**	....	0.32	1.03	2.83
John Reardon & Sons Company Cambridge, Mass.								
Rearco Ground Bone	2.47	4.53	22.88	22.95	....	15.49	....	....
Rearco Sheep and Goat Manure	1.25	1.95	....	1.16	1.00	1.03	2.00	2.90
Rogers & Hubbard Co. Portland, Conn.								
Hubbard's All Soils Fertilizer 4–8–4	4.00	4.14	....	8.83	8.00	8.00	4.00	4.22
Hubbard's High Potash Fertilizer 4–8–10	4.00	4.03	...	8.93	8.00	8.01	10.00	10.14
Hubbard's Potato Fertilizer 5–8–7	5.00	5.08	....	9.24	8.00	7.84	7.00	7.44
Hubbard's Superphosphate	....	....	....	21.55	20.00	20.95	....	....

	Nitrogen		Phosphoric Acid				Potash	
			Total		Available			
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Hubbard's Top Dressing 8–5–8	8.00	8.05	....	7.49	5.00	6.43	8.00	8.59
Red H Brand 3–10–4	3.00	3.12	....	11.25	10.00	10.31	4.00	4.71
Red H Brand 4–8–4	4.00	4.20	....	8.79	8.00	8.00	4.00	4.44
Red H Brand 4–8–7	4.00	4.24	....	8.70	8.00	8.00	7.00	7.42
Red H Brand 4–8–10	4.00	4.16	....	8.95	8.00	8.01	10.00	10.00
Red H Brand 5–8–7	5.00	5.09	....	8.89	8.00	8.05	7.00	7.34
Red H Brand 7–6–6	7.00	6.83	....	7.01	6.00	6.49	6.00	6.16
Red H Brand 8–16–14	8.00	8.28	....	16.50	16.00	16.04	14.00	14.64
Superphosphate 20% Granular	....	....	....	21.25	20.00	20.37	....	....
Standard Wholesale Phosphate and Acid Works Baltimore, Md.								
Standard 45% Superphosphate	....	....	....	45.08	45.00	44.62	....	....
Summers Fertilizer Co. Searsport, Me.								
Summers 47% Superphosphate	....	..	47.00	46.37	47.00	46.12	....	....
Swift & Company Fertilizer Works Baltimore, Md.								
Roselawn Special Plant Food 5–8–7	5.00	5.02	....	8.92	8.00	8.07	7.00	7 00
Vigoro 4–12–4 Complete Plant Food	4.00	4.00	....	12.86	12.00	12.06	4.00	4.49

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